

Isamu UMEZAKI* & Romeo B. MODELO, Jr.*: **The marine
blue-green algae in the Visayas of the Philippines**

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ビザヤス地区の海産藍藻類

In 1962 Velasquez reported 8 families, 33 genera, 162 species and 3 forms including marine species in his paper "The blue-green algae of the Philippines." Martinez (1984) listed all the reported blue-green algal species in the Philippines which includes 361 species in 12 families and 59 genera.

The present paper deals with marine blue-green algae of Panay, Cebu, Bohol and Leyte Islands in the Visayas of the Philippines and enumerates 51 species belonging to 7 families and 26 genera. Twenty-three species are newly recorded from the Philippines. Among the species recorded, some are terrestrial. They were found growing on rocks one to two meters above high tide level or on rocks a little above the supratidal zone. These are *Gloeothece rupestris*, *Scytonema alatum*, *S. hofmanni* and *S. siculum*. Subtropical and tropical marine species were collected: *Calothrix pilosa*, *Gardnerula corymbosa*, *Brachytrichia quojii* and *Herpyzonema intermedium*. The genus *Herpyzonema* (*H. intermedium*), which was established by Weber van Bosse (1913) from Indonesia, is reported here for the first time. This species was collected from Union, Nabas, Aklan, Panay island. Species forming red-tides in tropical and subtropical ocean waters were also found as plankton in the water off Cebu and Bohol: *Trichodesmium contortum*, *T. erythraeum* and *T. thiebautii*.

The survey in the Visayas was made under the research project on "Scientific survey of marine algae and their resources in the Philippine Islands" conducted as one of the overseas research projects with grants from the Ministry of Education, Science and Culture of Japan, No. 60041039 (1985), from November 16 to December 14, 1985. The collection from Panay was done by I. Umezaki and from Cebu, Bohol and Leyte by R.B. Modelo, Jr. Some specimens, which were collected by H. Ogawa in May 1983 at Leganes, Iloilo, Panay Island and Guimaras

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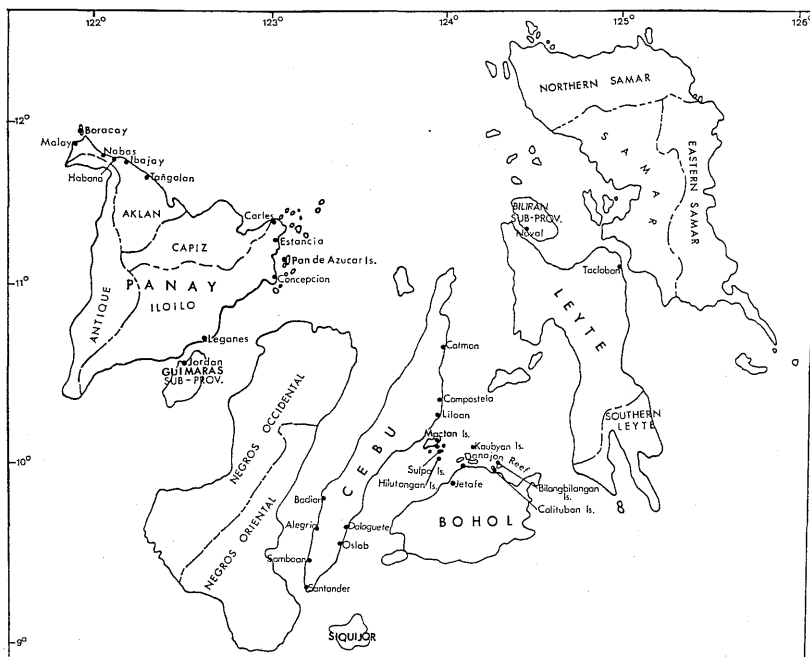


Fig. 1. Map of Visayas, Philippines showing locations of algal collection in Panay, Guimaras, Cebu, Bohol and Leyte.

Island were included in this study (Fig. 1). The specimens studied are deposited in the Herbarium, Laboratory of Fishery Resources, Division of Tropical Agriculture, Graduate School of Agriculture, Kyoto University, Kyoto, Japan. Species with an asterisk (*) indicate that they are new records to the Philippines and they are not included in the reports of Velasquez (1962) and Martinez (1984).

In the following list the names of species of the order Chroococcales are based upon those used by Geitler (1932), those of the family Oscillatoriaceae by Gomont (1892), and those of families Nostocaceae, Rivulariaceae, Scytonemataceae, and Stigonemataceae by Bornet & Flahault (1886-1888), although some corrections were made.

Enumeration of Species

Chroococcales Chroococcaceae*Aphanocapsa litoralis* var. *macrococca* Hansgirg*

Panay: Bagotawo, Pan de Azucar, Concepcion, Iloilo. Among the branches of *Corallina* sp. in two meters below the sea-surface, 7004a, 25 Nov. 1985. In the sponges living on intertidal rocks, 7012, 25 Nov. 1985.

Gloethece rupestris (Lyngbye) Bornet*

Panay: Union, Nabas, Aklan. On red clay wall which was shaded by overhanging rocks and wetted by dripping fresh-water, one to two meters above high tide level, usually together with *Scytonema alatum*, 7036b, 7038, 7039, 7043, 7079, 4 Dec. 1985.

Colonies forming a mucous, deep blue-green, expanded mass, 2-5 mm thick, one-, two-, three-, four-celled, or sometimes many celled, 10-30 μ m broad; cells nearly spherical to ellipsoidal, 2.0-5.0(-7.0) \times 5.0-10.0 μ m in size without mucous material; mucous materials surrounding cells hyaline, sometimes yellowish or pale brown, lamellated.

Merismopoedia glauca (Ehrenberg) Naegeli

Cebu: Kalawisan, Mactan Is. Among the filaments of *Lyngbya aestuarii* in *Caulerpa* farm, 7084c, 27 Nov. 1985.

Chamaesiphonaceae

Xenococcus pyriformis Setchell & Gardner*

Cebu: Kalawisan, Mactan Is. On *Rhizoclonium africanum* in *Caulerpa* farm, 7085b, 27 Nov. 1985.

Xenococcus schousboei Thuret*

Panay: Boracay, Malay, Aklan. On *Lyngbya semiplena*, 7021c, 3 Dec. 1985.

Hyella caespitosa Bornet & Flahault*

Panay: Pan de Azucar, Concepcion, Iloilo. In dead mollusk shells in the intertidal zone, 7015, 25 Nov. 1985; Concepcion, Iloilo. In barnacle shells, in association with *Mastigocoleus testarum*, 7054, 7057, 26 Nov. 1985. In dead coral blocks, together with *Mastigocoleus testarum* and *Plectonema terebrans*, 7063, 26 Nov. 1985; Union, Nabas, Aklan. In calcareous rocks in the intertidal zone, 7072, 7078, 4 Dec. 1985.

Dermocarpa clavata Geitler*

Bohol: Bilangbilangan Is. On *Sphacelaria* sp. growing on *Sargassum* sp.,

7088, 21 Nov. 1985. Cebu: Sulpa off Mactan Is. On *Lyngbya sordida*, 7096c, 23 Nov. 1985.

Dermocarpa leibleiniae (Reinsch) Bornet*

Panay: Caticlan, Potel Point, Aklan. On *Lyngbya majuscula*, 7026b, 3 Dec. 1985; Tañgapan, Aklan. On *Lyngbya confervoides*, 7028b, 5 Dec. 1985.

Dermocarpa prasina (Reinsch) Bornet*

Panay: Concepcion, Iloilo. On *Sphacelaria* sp. and *Gelidium* sp. growing on mollusk shells, 7066, 25 Nov. 1985.

Oscillatoriales (=Hormogonales) Oscillatoriaceae

Spirulina gomontii Gutwinski*

Panay: Boracay, Malay, Aklan. Among the filaments of *Lyngbya semiplena*, 7032c, 3 Dec. 1985.

Spirulina labyrinthiformis (Meneghini) Gomont*

Panay: Union, Nabas, Aklan. Among the filaments of *Hydrocoleum lyngbyaceum*, 7045b, 4 Dec. 1985. Among the filaments of *Dichotomosiphon tuberosus*, 7046c, 4 Dec. 1985.

Spirulina subsalsa Oerstedt

Panay: Boracay, Malay, Aklan. Among the filaments of *Lyngbya semiplena*, 7032d, 3 Dec. 1985. Cebu: Poblacion, Cordova, Mactan Is. Among the filaments of *Lyngbya semiplena*, 7101c, 26 Nov. 1985.

Oscillatoria bonnemaisonii Crouan

Panay: Pan de Azucar, Concepcion, Iloilo. Among small algae, *Champia parvula*, *Ceramium* sp., *Polysiphonia* sp. and *Heterosiphonia* sp., 7001a, 25 Nov. 1985; Union, Nabas, Aklan. Among the filaments of *Dichotomosiphon tuberosus* growing on intertidal rocks, 7046b, 4 Dec. 1985.

Oscillatoria corallinae (Kuetzing) Gomont

Panay: Bagotawo, Pan de Azucar, Concepcion, Iloilo. On intertidal rocks, together with *Oscillatoria bonnemaisonii*, 7001b, 25 Nov. 1985; Union, Nabas, Aklan. Among the filaments of *Symploca hydroides* in the intertidal zone, 7047b, 4 Dec. 1985.

Oscillatoria margaritifera (Kuetzing) Gomont

= *Arthrospira breviararticulata* Setchell & Gardner

Panay: Union, Nabas, Aklan. Among the filaments of *Dichotomosiphon tuberosus*, 7041, 4 Dec. 1985. Cebu: Hilutangan, off Mactan Is. Among the branches of *Boodlea coacta*, 7109, 29 Nov. 1985.

Trichodesmium contortum Wille*

Cebu: Cordova, Mactan Is. As plankton in the sea one kilometer off the coast, 7117c, 26 Nov. 1985. Bohol: Jetafe. As plankton in the sea one kilometer off the coast, 7116c, 21 Nov. 1985.

Trichomes not forming a colony, but as individuals, loosely coiled, usually short, 75–120 μm long, 20.0–25.0 μm broad; cells 5.0–10.0 μm long; cross walls of trichome not constricted.

Trichodesmium erythraeum Ehrenberg*

Cebu: Cordova, Mactan Is. As plankton in the sea one kilometer off the coast, 7117a, 26 Nov. 1985. Bohol: Jetafe. As plankton in the sea one kilometer off the coast, 7116a, 21 Nov. 1985.

Trichomes not forming a bundle-shaped colony, but mostly as individuals, 200–350 μm long, 8.0–10.0 (–15.0) μm broad, slightly attenuated at apices; cells (3.0)4.0–5.0 μm long; cross walls of trichome not constricted.

Trichodesmium thiebautii Gomont

Cebu: Cordova, Mactan Is. As plankton in the sea one kilometer off the coast, 7117b, 26 Nov. 1985. Bohol: Jetafe. As plankton in the sea one kilometer off the coast, 7116b, 21 Nov. 1985.

Trichomes forming a rope-like colony, which is 75 μm broad and 1200 μm long, but mostly as individuals, 5.0–7.5 μm broad; cells 5.0–8.5 μm long, nearly quadrate to 1.5 times as long as the diameter.

Lyngbya aestuarii (Mertens) Lyngbye

Panay: Union, Nabas, Aklan. On intertidal rocks, 7033a, 4 Dec. 1985; Leganes, Iloilo. In a milkfish pond, 7120, 30 May 1983.

Lyngbya confervoides C. Agardh

Panay: Pan de Azucar, Concepcion, Iloilo. In rock depressions along high tide level, 7008a, 25 Nov. 1985; Tañgalan, Aklan. On *Galaxaura* sp., 7028a, 5 Dec. 1985. Bohol: Kaubyan Is. On rocks one meter below the sea-surface, 1075, 1077, 21 Nov. 1985.

Filaments (7008a) 4 cm long, 20.0–24.0 μm broad; trichomes 15.0–20.0 μm broad.

Lyngbya epiphytica Hieronymus*

Panay: Pan de Azucar, Concepcion, Iloilo. On *Lyngbya confervoides*, 7008b, 25 Nov. 1985; Boracay, Malay, Aklan. On *Lyngbya semiplena*, 7021b, 7024, 3 Dec. 1985; Tañgalan, Aklan. On *Lyngbya confervoides*, 7028c, 5 Dec. 1985.

Cebu: Kalawisan, Mactan Is. On *Lyngbya semiplena*, 7086b, 27 Nov. 1985.

Lyngbya kuetzingii Schmidle*

Cebu: Kalawisan, Mactan Is. On *Rhizoclonium africanum* in *Caulerpa* farm, 7085a, 27 Nov. 1985.

Lyngbya lutea (Agardh) Gomont

Panay: Boracay, Malay, Aklan. On *Galaxaura* sp., together with *Lyngbya semiplena*, 7032b, 3 Dec. 1985.

Lyngbya majuscula (Dillwyn) Harvey

Panay: Bagotawo, Pan de Azucar, Concepcion, Iloilo. On *Jania* sp. and *Corallina* sp. growing on rocks two meters below the sea-surface, 7003, 7005, 7060, 25 Nov. 1985; Caticlan, Potel Point, Aklan. On intertidal rocks, 7026a, 3 Dec. 1985; Union, Nabas, Aklan. On intertidal rocks, 7027, 7034, 7069, 4 Dec. 1985; Boracay, Malay, Aklan. On intertidal rocks, 7030, 7067, 7068, 3 Dec. 1985; Bugtong Bato, Ibajay, Aklan. On *Actinotrichia fragilis* and *Amphiroa* sp. two meters below the sea-surface, 7083, 5 Dec. 1985. Cebu: Poblacion, Cordova, Mactan Is. On *Sargassum* sp., 7097, 7098, 7101a, 7102, 7103a, 7104, 7108, 26 Nov. 1985; Mututinao, Badian. On rocks in *Gelidiella acerosa*-zone, 7110, 2 Dec. 1985; Bo, Tumandoc, Algeria. On *Caulerpa* sp., 7111, 7112, 2 Dec. 1985; Pasil, Santander. On rocks one meter below the sea-surface, 7115, 3 Dec. 1985. Bohol: Calituban Is. On *Dictyota* sp. and on rocks one to two meters below the sea-surface, 7095, 23 Nov. 1985; Kaubyan Is. On *Sargassum* sp. or on rocks one meter below the sea-surface, 7089, 7090, 7091, 21 Nov. 1985.

Filaments usually forming a large expanded mass on rocks or larger algae growing on rocks below the low tide level, 30–40 (–50) μm broad; sheaths 2.0–5.0 (–7.5) μm thick, usually lamellated; trichomes 30.0–38.0 μm thick; cells 2.5–3.0 μm long.

Lyngbya majuscula is a common species in the Visayas.

Lyngbya nordgardhii Wille*

Bohol: Kaubyan Is. On *Lyngbya majuscula*, 7089b, 21 Nov. 1985. Cebu: Maribago, Mactan Is. On *Enteromorpha* sp., 7105, 28 Nov. 1985.

Lyngbya rivulariarum Gomont*

Panay: Pan de Azucar, Concepcion, Iloilo. In the fronds of *Brachytrichia quojii*, 7006b, 25 Nov. 1985; Union, Nabas, Aklan. On or in the sheaths of *Hydrocoleum lyngbyaceum*, together with *Spirulina labyrinthiformis*, 7045c, 4 Dec. 1985.

Lyngbya semiplena (C. Agardh) J. Agardh

Panay: Pan de Azucar, Concepcion, Iloilo. On intertidal rocks, 7014b, 25 Nov. 1985; Boracay, Malay, Aklan. On intertidal rocks, 7021a, 7024a, 3 Dec. 1985. On *Galaxaura* sp., 7032a, 3 Dec. 1985. Cebu: Kalawisan, Mactan Is. On dead snail shells in *Caulerpa* farm, 7086a, 27 Nov. 1985.

Lyngbya sordida (Zanardini) Gomont

Bohol: Calituban Is. On *Sargassum* sp., 23 Nov. 1985. Cebu: Sulpa, off Mactan Is. On *Sargassum* sp., 7096a, 23 Nov. 1985; Tonggo, Marigondon, Mactan Is. On *Sargassum* sp., 7107, 28 Nov. 1985; Catmon. On *Corallina* sp., 7114, 4 Dec. 1985.

Symploca hydroides Kuetzing

Panay: Boracay, Malay, Aklan. On intertidal rocks or on rocks a little below the low tide level, 7025, 7031, 7059, 3 Dec. 1985; Union, Nabas, Aklan. On intertidal rocks, 7040, 7042, 7047a, 4 Dec. 1985; Leganes, Iloilo. On intertidal rocks, 7121, 17 May 1983. Guimaras: Jordan. On intertidal rocks, 7122, 18 May 1983, 7123, 13 May 1983.

Fronds mat-like or hair-pencil-like, up to 5 cm broad and up to 5 cm long; filaments 7.0–12.0 μm broad; trichomes 6.0–9.5 μm broad, pale blue-green or violet green; cross walls of the terminal part of trichome slightly constricted.

Hydrocoleum cantharidosmum (Montagne) Gomont

Bohol: Danajon reef, nearby Anacto seafarm. On intertidal rocks, 7092, 22 Nov. 1985. Cebu: Maribago, Mactan Is. On rocks one meter below the sea-surface, 7106, 28 Nov. 1985.

Filaments forming a blue-green mucous mass, 32.0–37.5 μm broad; trichomes 22.5–27.5 μm broad.

Hydrocoleum lyngbyaceum Kuetzing

Panay: Pan de Azucar, Concepcion, Iloilo. Among the filaments of *Dichotomosiphon tuberosus*, 7011, 25 Nov. 1985; Union, Nabas, Aklan. On intertidal rocks, 7035, 7045a, 7049, 4 Dec. 1985.

Microcoleus chthonoplastes Thuret

Panay: Concepcion, Iloilo. In mud covering rocks in the intertidal zone, together with *Gardnerula corymbosa*, 7017, 26 Nov. 1985; Union, Nabas, Aklan. Among the filaments of *Scytonema hofmanni* and *S. siculum*, 7036d, 4 Dec. 1985. Among the filaments of *Dichotomosiphon tuberosus* in the intertidal zone, 7046a, 4 Dec. 1985. Cebu: Kalawisan, Mactan Is. Among the filaments of *Lyngbya*

aestuarii, 7084a, 27 Nov. 1985.

Microcoleus tenerrimus Gomont

Panay: Union, Nabas, Aklan. Among the filaments of *Lyngbya aestuarii*, 7033b, 4 Dec. 1985.

Microcoleus vaginatus (Vaucher) Gomont

Cebu: Lawis, Cordova, Mactan Is. On intertidal rocks, 7099, 26 Nov. 1985.

Fronds blue-green mass, 0.5 cm high; common sheaths very mucous, always diffused, sometimes individual sheath surrounding a trichome clearly; trichomes slightly attenuated at apices or not, 7.0–9.0 μm broad; apical cell of trichome with calyptra, sometimes rounded without calyptra; cells quadrate or a little longer than diameter, 6.0–10.0 μm long; cross walls of trichome slightly constricted or not.

Microcoleus voukii Frémy*

Bohol: Bilangbilangan Is. Among the utricles of *Codium repens*, 7087, 21 Nov. 1985.

Filaments 250–600 μm long, several within the common sheath, but in many cases as individual trichome; trichomes 2 μm broad.

Nostocaceae

Nodularia sphaerocarpa Bornet & Flahault*

Cebu: Sulpa, off Mactan Is. Among the filaments of *Lyngbya sordida*, 7096, 23 Nov. 1985. Among the filaments of *Lyngbya majuscula*, 7101b, 26 Nov. 1985. Bohol: Jetafe. As plankton in the sea one kilometer off the coast, 7116d, 3 Dec. 1985.

Richelia intracellularis J. Schmidt

Panay: Estancia, Iloilo. In the cells of *Rhizosolenia styliiformis*, 7124, 24 Nov. 1985.

Rivulariaceae

Calothrix crustacea Thuret

Panay: Pan de Azucar, Concepcion, Iloilo. On mollusk shells in the intertidal zone, 7014a, 25 Nov. 1985; Concepcion, Iloilo. On *Gelidiella acerosa* on intertidal rocks, 7058, 26 Nov. 1985.

Calothrix pilosa Harvey

Panay: Concepcion, Iloilo. On intertidal rocks, 7019, 7020, 7053, 26 Nov. 1985; Boracay, Malay, Aklan. On intertidal rocks, 7022, 7023, 3 Dec. 1985.

Dichothrix fucicola (Kuetzing) Bornet & Flahault*

Bohol: Danajon reef, nearby Anacto seafarm. On intertidal rocks, 7093, 22 Nov. 1958.

Filaments 1-2 mm long, 45.0-60.0 (-65.0) μm broad; sheaths lamellated, 10.0-12.5 μm thick; trichomes terminating into a long, hyaline hair at apices, 17.5-28.0 μm broad; cells in the middle or basal parts of trichome quadrate or a little longer than the diameter, those in the apical part of trichome 1/3-1/6 times as long as the diameter; heterocysts basal and intercalary, the intercalary ones quadrate or a little longer, 22.5-32.0 \times 27.0-42.0 μm in size.

Isactis plana (Harvey) Thuret

Panay: Pan de Azucar, Concepcion, Iloilo. On living limpet shells on intertidal rocks, 7013, 25 Nov. 1985.

Gardnerula corymbosa (Harvey) J. de Toni

= *Polythrix corymbosa* Harvey

Panay: Concepcion, Iloilo. On intertidal rocks, 7018, 26 Nov. 1985.

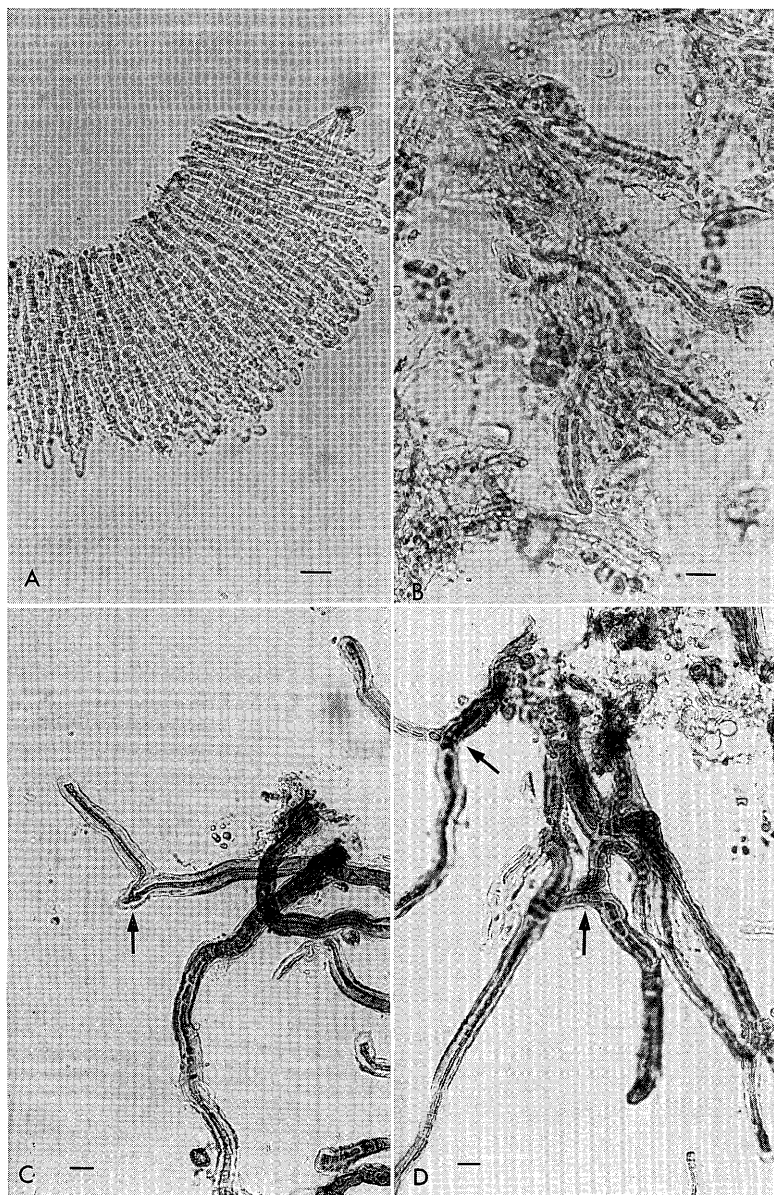
Kyrtuthrix maculans (Gomont) Umezaki

= *Brachytrichia maculans* Gomont; = *Kyrtuthrix dalmatica* Ercegović.

Panay: Igbauwa near Habana, Aklan. On granite rocks or in lime rocks in the intertidal zone in the supratidal zone, 7051, 4 Dec. 1985; Concepcion, Iloilo. On intertidal rocks, 7061, 7062, 26 Nov. 1985; Union, Nabas, Aklan. In lime stones in the intertidal zone, 7071, 4 Dec. 1985.

On hard rocks such as granites, the filaments of the species grow on the surface of the substratum, forming a hard crustaceous frond and compactly in parallel to each other. It corresponds to *Brachytrichia maculans* figured by Gomont (1901). It calls *Brachytrichia maculans* type or crustaceous type (Fig. 2A). On the other hand, on calcareous rocks such as lime stones or coral blocks they bore deeply into the substratum, growing endolithic in the substratum and not forming a compact frond as in the former. It corresponds to *Kyrtuthrix dalmatica* described by Ercegović (1929). It calls *Kyrtuthrix dalmatica* type or boring type (Fig. 2B). From the above reason *Brachytrichia maculans* Gomont (1901) was combined into the genus *Kyrtuthrix* (Ercegović 1929) by Umezaki (1958).

Fig. 2. A-B. *Kyrtuthrix maculans* (Gomont) Umezaki. A: vertical section of a hard crustaceous frond which grew on rock surface showing compactly paralleled filaments—crustaceous type. B: Filaments boring into a lime stone which are irregularly bent—boring type. C-D. *Herpyzonema intermedium* W. v. Bosse. Filaments boring into a lime stone showing Y-form branching (arrow). (Scale bars: A-D, 10 μm)



The genus *Kyrtuthrix* (*K. dalmatica*) was placed in the family Mastigocladaceae by Ercegović (1929, 1932) and by Geitler (1932), in company with *Brachytrichia*, *Mastigocladus*, *Herpyzonema* and *Lithonema*. Golubić (1976) placed the genus *Kyrtuthrix* in the Rivulariaceae. Drouet (1973) treated the *Kyrtuthrix* (*K. dalmatica* Ercegović) as a synonym of the genus *Calothrix* (*C. crustacea* Schousb. & Thur.) and placed it in the Nostocaceae.

Scytonemataceae

Scytonema alatum (Carmichael) Borzi

= *Petalonema alatum* Berkeley

Panay: Union, Nabas, Aklan. On red clay wall which was shaded by overhanging rocks and wetted by dripping freshwater, 7037, 7044, 4 Dec. 1985.

Filaments forming a widely expanded, velvety stratum, 1.0-1.2 mm long, 30-50 μm broad, the branching single or geminate; sheaths pale brown, 2.0-7.5 μm thick, lamellated in funnel-shape in the apical part of filament; trichomes 12.5-20.0 μm broad, the terminal part slightly thickened in club-shape; cells of the middle to apical parts of trichome 4.0-10.0 μm long, 1/2-1/4 times as long as the diameter, those of the basal part of trichomes 2.0-2.5 times as long as the diameter; heterocysts single or two in series, a little longer than the diameter.

Scytonema hofmanni Agardh

Panay: Union, Nabas, Aklan. On calcareous rocks 0.5-1.0 meter above the high tide level, 7036a, 4 Dec. 1985.

Scytonema siculum Borzi*

Panay: Union, Nabas, Aklan. On calcareous rocks 0.5-1.0 meter above the high tide level, 7036b, 7073, 4 Dec. 1985.

Filaments 6.0-15.0 μm broad; sheaths thick, up to 5.0 μm thick, dark brown, lamellated; trichomes 4.0-7.5 μm broad; cells 5.0-6.0 μm long; heterocysts single or up to three in series.

Microchaete vitiensis Askenasy*

Cebu: Lawis, Cordova, Mactan Is. On *Lyngbya majuscula*, 7103b, 26 Nov. 1985; Sulpa, off Mactan Is. On *Lyngbya sordida*, 7096b, 23 Nov. 1985.

Plectonema terebrans Bornet & Flahault*

Panay: Concepcion, Iloilo. In dead coral blocks, mostly in company with *Mastigocoleus testarum* and *Hyella caespitosa*, 7056, 7064b, 26 Nov. 1985.

Stigonemataceae

Brachytrichia quojii (Agardh) Bornet & Flahault

Panay: Bagotawo, Pan de Azucar, Concepcion, Iloilo. On rocks along high tide level, 7002, 7006a, 7010, 25 Nov. 1985; Igbauwa near Habana, Aklan. On rocks along high tide level, 7050, 4 Dec. 1985.

Fronds 1.3–1.5 cm broad; hormogonia 12.0–23.0 μm long.

Drouet (1981) spelled the specific epithet "*Quojii*" after basionym *Nostoc Quojii* Agardh (1824).

Herpyzonema intermedium Weber van Bosse*

Panay: Union, Nabas, Aklan. In calcareous rocks one to two meters above the high tide level – *Bostrychia*-zone, 7070, 7080, 7081, 4 Dec. 1985.

The genus *Herpyzonema* was established by Weber van Bosse in 1913 on the basis of the type species *H. intermedium* (as *H. intermedia*) from Indonesia. Since Weber van Bosse's report, the species has never been discovered from any part of the world. The authors were fortunate in collecting the species which grew boring in lime rocks at the above-mentioned locality. The filaments are branched in characteristic Y-form (Geitler's V-Verzweigung) as *Brachytrichia quojii* does. Sometimes, the filaments are changed into hormogone-like terminals surrounded by thick, light brown sheath. Although W. v. Bosse did not find hormogonia in the species, it seems that the species reproduces by hormogonia without forming endospores which she found in her specimen. The species from Panay was found associated with *Hyella caespitosa* which produced endospores, a reproductive organ of the Chamaesiphonaceae. The filaments in the authors' specimen are sometimes ended into hair-like terminals, although they are not true hairs as in *Brachytrichia quojii* and rivulariaceous species. The filaments are slightly boring into the lime rocks. They are 7.0–12.5 μm broad and with pale brown or colourless sheaths up to 3 μm thick and sometimes lamellated. The heterocysts are intercalary, rarely terminal, 3.0–7.0 \times 6.0–6.5 μm in size (Fig. 2C and D).

Mastigocoleus testarum Lagerheim*

Panay: Pan de Azucar, Concepcion, Iloilo. In dead mollusk shells, together with *Hyella caespitosa*, 7016, 25 Nov. 1985; Concepcion, Iloilo. In *Halimeda opuntia*, 7052, 26 Nov. 1985. In barnacle shells, 7055, 7057a, 7064a, 26 Nov. 1985; Union, Nabas, Aklan. In coral blocks, 7078, 4 Dec. 1985. In mollusk shells, 7082, 4 Dec. 1985.

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昭和60年度文部省科学研究費補助金（海外学術調査, No. 60041039）により昭和60年11月16日～12月14日に、フィリピン国ビザヤス地区（バナイ、ギマラス、セブ、ボホール、レイテ）で行った海藻調査の一部である海産藍藻類の報告である。2目7科26属51種が採集された。そのうち、23種はフィリピン国新産種であった。亜熱帯及び熱帯種である *Calothrix pilosa*, *Gardnerula corymbosa*, *Brachytrichia quojii* および *Herpyzonema intermedium* がみつげられた。石灰穿入藻なる *Herpyzonema intermedium* Weber van Bosses (1913) は同属創設以来の初めての発見である。*Kyrtuthrix maculans* (Gom.) Umezaki の石灰岩への穿入型 (*Kyrtuthrix dalmatica* 型) と、硬い岩の表面に生育する殻状型 (*Brachytrichia maculans* 型) の2型がみつげられた。熱帯及び亜熱帯海の赤潮形成藍藻3種 (*Trichodesmium contortum*, *T. erythraeum*, *T. thiebautii*) がプランクトンとして発見された。

□Scagel, R. F., D. J. Garbary, L. Golden & M. W. Hawkes: **A synopsis of the benthic marine algae of British Columbia, northern Washington and southeast Alaska** i-v+444 pp. 1986. Phycological Contribution No. 1. Department of Botany, The University of British Columbia. 15 カナダドル (送料, 船便 7.5 カナダドル, 航空便 15 カナダドル). カナダ太平洋沿岸を中心にアメリカ・ワシントン州北部よりアラスカ南部に生育する海藻のシノプシスである。627 分類群 (黄金色藻 10, 緑藻 102, 褐藻 130, 紅藻 389) が収録され, Basionym に加えて1957年以降に発表された分類・分布に関するすべての文献が列挙される。最近分類上問題となった分類群には簡潔な脚注があり, その数は236に及ぶ。日本沿岸には収録海藻と共通するものがあり生育するので, この分野に興味をもつわが国の研究者にとっても役に立つ刊行物である。また, 最近提唱されている新しい分類システムが随所に採用されているので, この面の研究の動向を知るにも便利である。市販されていないので, 註文は送料を添えて直接に下記に申し込むこと。R. F. Scagel, Department of Botany, The University of British Columbia, #3259-6270 University Blvd, Vancouver, B. C. V6T 2B1, Canada. なお著者の一人 Scagel 博士は先に *An annotated list of the marine algae of British Columbia and northern Washington*. National Museum of Canada Bulletin No. 150 (1957) を刊行しており, これには1957年までの文献が各分類群に付されている。

(千原光雄)